PATENT COOPERATION TREATY

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PCT

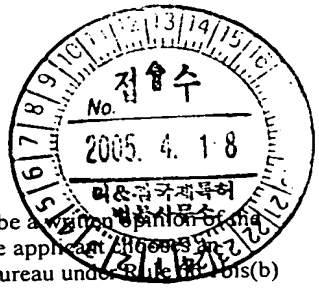
WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	13 April 2005 (13.04.2005)
Applicant's or agent's file reference: FP04026	FOR FURTHER ACTION: See paragraph 2 below
International application No.: PCT/KR 2004/001147	International filing date *(day/month/year)*: 14 May 2004 (14.05.2004)
	Priority Date *(day/month/year)*: 30 May 2003 (30.05.2003)
International Patent Classification (IPC) or both national classification and IPC: H04L 12/26, 12/46, 29/06	
Applicant: LG ELECTRONICS, INC.	

1. This opinion contains indications relating to the following items:

- [x] Cont. No. I — Basis of the opinion
- [ ] Cont. No. II — Priority
- [ ] Cont. No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Cont. No. IV — Lack of unity of invention
- [x] Cont. No. V — Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Cont. No. VI — Certain documents cited
- [ ] Cont. No. VII — Certain defects in the international application
- [ ] Cont. No. VIII — Certain observations on the international application



2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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Form PCT/ISA/237 (cover sheet) (January 2004)

International application No.
PCT/KR 2004/001147

Continuation No. I

Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed.

Continuation No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims **2-49**	**YES**
	Claims **1**	**NO**
Inventive step (IS)	Claims **----**	**YES**
	Claims **1-49**	**NO**
Industrial applicability (IA)	Claims **1-49**	**YES**
	Claims **----**	**NO**

2. Citations and explanations:

Cited documents:

D1: Koon-Seok Lee, Hoan-Jong Choi, Chang-Ho Kim, Seung-Myun Baek,'A new control protocol for home appliances-LnCP.' In: International Symposium on Industrial Electronics, 2001. Proceedings. ISIE 2001. 12-16 June 2001 pages: 286 - 291 volume 1

D2: Yi-Min Wang; Russel, W.; Arora, A.; JunXu; Jagannatthan, R.K.; 'Towards dependable home networking: an experience report.' In: Proceedings International Conference on Dependable Systems and Networks, 2000. DSN 200025 - 28 June 2000, Los Alamitos, CA, USA, IEEE Computer Society pages: 43–48

Document D1 discloses a description of the control protocol, LnCP (Living network Control Protocol), targeting at low implementation cost networking system in home environment. The protocol is based on multi-master system and uses a peer-to-peer communication model.

The network is constructed by linking appliances, which implement the LnCP on their microcontroller, via a networking bus. Some appliances that do not have micorocontroller are combined with a module, which contains LnCP and enables them to be networked. Single wire or power lines are the candidates for the medium as networking bus. If power line is used as medium then each appliance must connect to power line transceiver, whose encoding method is not defined in LnCP. Any appliance or the combination of appliance and a module, which is attached to the bus on the network, is referred to as a node. The network interface

must ensure that each node has half duplex communications, and can sense activity on the network.

The LnCP allows any node on the bus to communicate with and control any other node in living network. Even the LnCP introduce the network management device to interface with user through keyboard and screen, there is no central control device. Consequently there is no hierarchy on product-to-product communications. LnCP covers only the node communication protocol ; the protocol intended for home appliances in living network. It does not cover the Router communications protocol.

Since LnCP allows communication of a variety of data types, from simple control commands, to more complex information such as image data and program code, the networked appliances can provide the user the following functions: Control : Control the appliances on/off or variable power. Monitoring : Monitor the operating state and sensor of appliances. Automation: Automatic control between devices without user operating. Download : Upgrade the software in microcontroller to enhance the basic functions or add new functions.

In section 2.2, D1 describes the protocol layers of the LnCP. For example, the Application layer can specify whether data should be transmitted with or without security adding that field in message header. PN allows the various application languages for Application Layer in spite of LnCP has its own language.

Document D2 discloses the Aladdin home networking system, which is the result of research on the heterogeneiry of various in-home networks, the undependable nature of consumer devices, and the lack of knowledgeable system administrators in the home environment.

In the Aladdin research project [WRAOO], the focus is on providing the system infrastructure for device connectivity by integrating the seven in-home networks into one dependable home network: powerline, phoneline, RF (Radio Frequency), IR (InfraRed), A/V LAN, security, and temperature control. The goal is to allow the users to plug in a device on any of these networks and make it part of the Aladdin system so that it can be used in conjunction with all the other devices to accomplish higher-level system-or user-directed tasks. To make the whole system good enough to live with, one must pay special attention to the dependability issues, including reliability, availability, security, and manageability. The second goal of the Aladdin project is to support dependable remote home automation and sensing.

In an ideal home networking system, the house is wired for running Ethernet and most devices are smart, networked devices connected directly to the Ethernet and running device control software themselves. A home gateway machine sits between the home network and the external communication infrastructures including the Internet and telephony. User Access Points (UAPs) are wall-mounted or stand-alone flat-panel displays deployed throughout the house to allow convenient access to inhome information (calendars, etc.) as well as the Internet from anywhere in the house. UAPs also expose Webbased, natural language-based, and voice-based interfaces for remotely controlling household devices and for monitoring environmental factors through remote sensors. Network bridges are provided for bridging devices on other communication media such as the powerline, RF, IR, and A/V cables to the Ethernet backbone.
Since smart devices are not yet generally available, the current Aladdin system accommodates existing devices by using six Windows 98 PCs and their peripherals to serve as both User Access Points and network bridges. The PCs are all connected by 1Mb/s or IOMb/s Ethernet over the phoneline. They also act as device proxies by running device

10/558434
International application No.
PCT/KR 2004/001147

control software on behalf of the devices.

In section 2, D2 defines the software architecture of the Alladdin system, which is devided into three layers. The application layer, for example, consists of device objects and device daemons that encapsulate device-and network-specific details, and home networking applications for control and sensing.

The present application relates to a home network system, comprising: a network based on a predetermined protocol; at least one electric device connected to the network; and a network manager connected to the network, for controlling and monitoring the electric device. Furthermore, the layer structure of the protocol is defined.

These features are the same as provided in D1 and D2, where the layer structure of the protocol is described, too. The present application with according to the independent claim 1 provides a home code control sub-layer for managing a home code for network security. However, this cannot be considered to be new, since network security is featured in almost all the networks used everyday, as mentioned in D1 and D2.

The features in the dependent claims 2–49 relate to the interfaces between the layers and the primitves that are required in these interfaces. Such means to enable communication are well known to a person skilled in the art and therefore cannot be considered to involve an inventive step.

The industrial applicability is given.
